THE IMPACT OF NUTRITIONAL MANAGEMENT ON COW HERD HEALTH AND PERFORMANCE

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Abstract. Beef cattle producers are starting to expect their veterinarian understand and advise them on the nutritional management of the breeding herd. Nutritional mismatches between the predominate forage on the ranch, the genetic ability of the females to produce, and timing of the calving season can lead to poor body condition, increased calf morbidity and mortality, delayed conception, and decreased weaning weights. The objective of this presentation is to highlight the impact of nutritional management on herd performance and productivity.

Key Words: Nutrition, Reproduction, Calf Performance, Protein, Energy, BCS

Introduction. An area of missed opportunity for many beef cattle producers involves the proper nutritional management of their cow herd. Reproductive efficiency, dystocia, perinatal calf heath, and calf growth rate during the suckling period are all heavily dependent on proper nutrition. In addition, the feeding program also represents the major cash cost associated with most cattle operations. Nutrition is an area of management that seems complicated to producers and so it is often neglected. This may provide the practitioner with an opportunity to provide sound management advice to increase herd productivity.

The "nutritionist vs. veterinarian" debate has long raged and this has been to the detriment of the cattle producers. When you consider that most of the disease processes that we are asked to investigate have a nutritional component, it is only natural that the practitioner should be involved with nutritional consultation at some level. A second very important point is that in many cases, the practitioner has

more day to day contact with the producer than any other professional. This allows the veterinarian to closely observe the management system employed on the ranch. Finally, there are very few nutritionists that are willing to work with small beef operations unless the producer buys a particular brand of feed.

Nutritional Management and Herd Productivity. Proper nutritional management can have a dramatic affect on herd productivity.[1-4] Depending upon the level of management, this affect can be negative or positive. Proper protein and energy balance in cow herds has showed to increase pregnancy rates and increase the number of females that become pregnant early in the breeding season. This is especially evident in heifers and young cows nursing their first calf. The rate of dystocia is also affected as thin calving cows and heifers have a higher tendency for calving difficulty even though calf birth weight is decreased. These factors have a dramatic impact on pounds of calf weaned per exposed female.

Calf performance during the suckling period is also affected by cow body condition.[5-7] Calves born to thin females have a higher death loss due to increased dystocia and decreased calf vigor. These calves do not stand and nurse as quickly and their ability to produce heat can be reduced 10-20%. These calves will have a greater chance of failure of passive transfer due to the fact that they do not nurse as aggressively and also because their dams will not produce as much colostrum. This results in a greater incidence of calf morbidity and mortality. Calves that are treated for preweaning disease have been shown to weigh 36 pounds less at weaning than their herd mates that remained healthy. These calves also showed decreased feedlot performance.

Key Components to Nutritional Management.

1. *Body Condition Scoring*. Using a 1 –9 numerical scale, it is possible to judge the nutritional status of a set of females.[2] Cattle add "flesh" from front to back, so the key areas to look at are the scapular spine, ribs 10-12, the lumbar transverse processes, the topline of the animal, and the tailhead. As the cows add condition, these structures will acquire more fat cover and the scale is shifted accordingly.

This scale is easily taught to producers so that when they are discussing the condition of the cattle, they can give you useful information. There are multiple publications dealing with this system available from various pharmaceutical companies and extension sources.

2. *Cow's Nutritional Calendar***.** Determining the cow's requirements begins with finding her place in the production year.[8] The cow's energy and protein needs are determined by her lactation and pregnancy status. This varies from very high immediately postcalving (Period 1) to relatively low at the time her calf is weaned (Period 3).

3. *Cow Characteristics***.** These factors would include cow size, weight, and level of milk production.[8] Feeding requirements are vastly different for the 900 pound Hereford cow when compared to the 1300 pound cow of continental breeding.

4. *Feed Intake Estimation***.** Depending upon the forage available, cows will eat approximately 1.5 to 3.0 % of their body weight in dry matter (DMI).[2] When feeding poor quality hay, dry matter intake may only reach 1.25%. High quality cool season grasses such as fescue and ryegrass will encourage a dramatic increase in DMI and most cows will easily meet their nutritional needs on this type of forage. Overestimating forage intake can lead to large errors in feeding. This is a particular area where producers need practitioner input.

5. *Feed Adjustment SWAGS***.** The feeding program needs to be adjusted periodically to match factors affecting the cow and her environment.[5,8] As a cow moves from Period 3 to Period 1 in her nutritional calendar, her energy requirement increases nearly 50%. Cows producing 10 pounds more milk than the average will require approximately 20% more protein and energy. Adding an additional 200 pounds to the mature cow size will push nutritional requirements up approximately 10%. Heat and cold stress will also change nutritional requirements. For every degree below the lower critical temperature, the cow's requirement for energy increases 1%. Keeping the females in management groups that minimize

differences in nutritional requirements and decrease the affect of the "pecking order" will help to simplify feeding management.

6. *Component Pricing.* This practice allows you to compare the relative economic value of feedstuffs that may differ widely in their composition. A classic example is comparing the value of corn grain (90% DM) with one of the "wet" co-products (40-50% DM). The co-products are much higher in protein and energy than corn grain, but you also have to account for all the water that is present. By converting different feeds to a dry matter basis, you can then compare the cost per unit of nutrient (protein or energy) that you are interested in.

Feeding Strategies. At the heart of any feeding strategy for the beef cow lies the concept of "how do we utilize the forage base available on the ranch?" This forage base hopefully is still in the pasture since the cow can "harvest" forage for less than half the cost of putting it into hay. However, we are often times faced with supplementing poor quality hay during the winter. Drought years represent an extreme challenge in terms of not only feeding the cows, but also helping to keep the operation solvent.

Protein supplementation should be considered when forage is adequate, but of low quality.[3,4] This occurs anytime the forage on the ranch matures and most of the time when we are dealing with hay sources. Small amounts (2-4 lbs. / hd. / day) of a medium- to high-protein supplement (25-40% CP) that has a high degree of rumen degradability will encourage better intake and utilization of low quality forage. This type of supplement works very well with systems that stockpile forage for winter use.

Energy supplementation should be considered during forage extremes.[3,4] The use of cereal grain supplements will allow animals to better utilize the lush growth of cool season forages each year. The cereal grains allow the animals to utilize the high level of protein in this forage. The main application in this case would be for the replacement heifer or young cow nursing her first calf, since this type of forage should meet the mature cow's requirements alone. The other extreme is during drought years

when forage availability is very limited. In this case, it may be more economical to "drylot" the cows and put them on full feed. Cows in this situation can get by with 5-10 lbs. of hay with the rest of the requirements coming from the grain mix. High energy supplements will actually substitute for forage, so that the cattle will actually eat less of whatever forage is available.

The utilization of byproduct feeds should also be considered.[9,10] Feeds such as whole cottonseeds, corn gluten feed, distiller's products, soybean hulls, wheat mids, etc. typically make an attractive alternative to traditional grain supplements. These feeds typically have to be stored in bulk and may have only seasonal availability. However, they can often be used as a single ingredient to supplement a forage program on an operation that has no feed mixing capability. These feedstuffs should be priced by the nutrient component that is most limiting in the current diet.

There are various methods that can be used to stretch feed resources and decrease feed costs while maintaining adequate growth and reproductive performance. Practices such as "split-feeding" or "stair step feeding" can be utilized to take advantage of compensatory gain in cattle. This is especially true when developing replacement heifers. The first half to two-thirds of the feeding period will have the heifers gaining at a relatively low rate. Then during the remainder of the feeding period, they are pushed to higher gains in order to achieve puberty in a timely fashion. This type of feeding program has been shown to decrease feed costs during the development program and still maintain high levels of reproductive performance.

In those cases where you need more than a feed sack, a pencil, and a calculator, there are multiple computer programs available that can be used to calculate least cost rations. These tools are especially useful when dealing with rations that contain multiple ingredients and supplements. Factors such as cost, ease of use, and adaptability to on farm feeding methods will determine how these programs can be utilized. One program that is commonly utilized by state extension services is called Beef Ration and Nutrition Decisions Software BRANDS). BRANDS is a spreadsheet based program

that has multiple modules designed to allow the user to match the nutritional needs of the animal with the available feedstuffs. These modules are designed for ration balancing for replacement heifers, mature cows, developing bulls, and feedlot animals. There is also a "professional" version that will calculate a least cost ration based on a set of minimum and maximum allowances designed by the user. During the second part of this presentation, common case scenarios will be analyzed for feeding alternatives using the BRANDS software.

Summary. The nutritional program, due to its importance to herd productivity and the input cost that it represents, requires proper management if the herd is to be profitable. The practitioner should not hesitate to offer consultation in this area since this part of the management program will have a direct impact on animal health and reproductive efficiency. Monitoring cow condition, forage availability, and the supplemental needs of the herd are a natural extension for the practitioner since they are often times the one that spends the most time on the ranch. Pulling this information together is the first step to ensuring the long-term survival of our clients.

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